

IN THE CLAIM

1 1. (Currently Amended) A method for allocating computer resources ~~for use by a~~
2 ~~program~~, comprising the steps of:

3 allocating a first resource of a first-resource type; and

4 allocating a second resource of a second-resource type different from the
5 first-resource type ~~having a shortest distance to the first resource~~;

6 wherein

7 a distance from the second resource to the first resource is the

8 shortest distance among distances between the first resource
9 to resources of the second-resource type;

10 the first resource and the second resource are allocated to be
11 assigned to a program;

12 the distance between the computer resources is stored as firmware;
13 and,

14 upon power-up, an operating system is provided, from the
15 firmware, with the distances between the computer

16 resources for use in allocating the first resource and the
17 second resource ~~portable to various operating systems~~

18 ~~running the program.~~

1 2. (Currently Amended) The method of claim 1 ~~where-in~~ wherein the distance between the
2 computer resources is selected from a group consisting of:

3 a distance measured from one resource to another resource and

4 a distance measured relative to a distance used as a reference.

1 3. (Currently Amended) The method of claim 2 wherein the distance between the
2 computer resources is measured in time units.

1 4. (Currently Canceled)

1 5. (Currently Amended) The method of claim 1 wherein the distance between the
2 computer resources is measured by the distance between nodes containing the
3 resources.

1 6. (Currently Amended) The method of claim 1 wherein the distance between the
2 computer resources is provided by the time taken to communicate from one
3 resource to another resource or the time taken to transfer data from one resource to
4 another resource.

1 7. (Currently Amended) The method of claim 1 wherein the computer resources reside in
2 a plurality of nodes each of which includes at least one resource being either an
3 I/O device, a memory device, or a processor.

1 8. (Original) The method of claim 7 wherein resources in a node are on a same bus or
2 share a point-to-point link.

1 9. (Original) The method of claim 1 wherein the first resource is an input device
2 associated with a storage device storing the program or storing data associated
3 with the program.

1 10. (Currently Amended) The method of claim 1 further comprising the step of allocating
2 a third resource ~~having a shortest distance to either the first resource or the second~~
3 ~~resource~~ of a third-resource type based on
4 the shortest distance between the first resource to resources of the third-
5 resource type; or
6 the shortest distance between the second resource and the resources of the
7 third-resource type.

1 11. (Currently Amended) A system ~~having computer resources for use by a program,~~
2 comprising:
3 ~~means for allocating~~ a first resource of a first resource type; and
4 ~~means for allocating~~ a second resource of a second resource type having a
5 ~~shortest distance to the first resource;~~
6 wherein
7 the first resource and second resource are selected based on a
8 plurality of distances including distances between a
9 plurality of first-type resources to a plurality of second-type
10 resources; and
11 the plurality of distances ~~between the resources~~ is are stored as
12 firmware ~~portable to various operating systems running the~~
13 ~~program~~ and provided to an operating system at power-up
14 for use in selecting the first resource and the second
15 resource.

1 12. (Currently Amended) The system of claim 11 wherein the plurality of distances are
2 distance ~~between the resources~~ is selected from a group consisting of:

3 a distance measured from one resource to another resource, and
4 a distance measured relative to a distance used as a reference.

1 13. (Currently Amended) The system of claim 11 wherein the plurality of distances are
2 ~~distance between the resources is~~ measured by the distance between nodes
3 containing the resources.

1 14. (Currently Amended) The system of claim 11 wherein the plurality of distances are
2 ~~distance between the resources is~~ measured in time units.

1 15. (Currently Amended) The system of claim 14 wherein the measured time units are
2 provided by the time taken to communicate from one resource to another resource
3 or the time taken to transfer data from one resource to another resource.

1 16. (Currently Amended) The system of claim 11 wherein ~~the resources~~ including the
2 first-type resources and the second-type resources reside in a plurality of nodes
3 each of which includes at least one resource being either an I/O device, a memory
4 device, or a processor.

1 17. (Original) The system of claim 16 wherein resources in a node are on a same bus or
2 share a point-to-point link.

1 18. (Currently Amended) The system of claim 11 ~~further comprising means for providing~~
2 ~~the distance between the resources to an operating system upon power up of the~~
3 ~~system~~ wherein the distance between the first resource and the second resource is

4 the shortest distance among the distances between a plurality of first-type
5 resources to a plurality of second-type resources.

1 19. (Currently Amended) The system of claim 11 further comprising ~~means for allocating~~
2 a third resource ~~having a shortest distance to either the first resource or the second~~
3 ~~resource~~ of a third-resource type wherein the third resource is selected based on
4 the shortest distance between the first resource to a plurality of third-type
5 resources; or
6 the shortest distance between the second resource to the plurality of third-
7 type resources.

1 20. (Currently Amended) A computer-readable medium embodying instructions that
2 perform a method for allocating computer resources ~~for use by a program~~, the
3 method comprising the steps of:
4 allocating a first resource of a first-resource type; and
5 allocating a second resource of a second-resource type different from the
6 first-resource type ~~having a shortest distance to the first resource~~;
7 wherein
8 a distance from the second resource to the first resource is the
9 shortest distance among distances between the first resource
10 to resources of the second-resource type;
11 the first resource and the second resource are allocated to be
12 assigned to a program;
13 the distance between the computer resources is stored as firmware;
14 and,

15 upon power-up of a system running an operating system, the
 16 operating system is provided, from the firmware, with the
 17 distances between the computer resources to be used in
 18 allocating the first resource and the second resource
 19 ~~portable to various operating systems running the program.~~

1 21. (New) A method for allocating computer resources, comprising the steps of:
 2 providing a plurality of first resources of a first-resource type;
 3 providing a plurality of second resources of a second-resource type
 4 different from the first-resource type;
 5 allocating a first resource of the first resource type and a second resource
 6 of the second-resource type;
 7 wherein
 8 a distance between the first resource and the second resource is the
 9 shortest distance among the distances between the plurality
 10 of first resources to the plurality of second resources;
 11 the first resource and the second resource are allocated to be used
 12 by a program;
 13 distances between the computer resources is stored as firmware;
 14 and
 15 upon power-up of a system running an operating system, the
 16 operating system is provided, from the firmware, with the

17 distances between the computer resources to be used in
18 allocating the first resource and the second resource.

1 22. (New) A system comprising:

2 firmware embodying distances between resources including a plurality of I/O
3 devices, a plurality of memory, and a plurality of processors; the resources
4 residing in a plurality of resource nodes;

5 an operating system;

6 wherein

7 upon power-up of the system, the operating system uses the distances in
8 the firmware to allocate an I/O device, a memory device, and a
9 processor for use by a program;

10 a distance between the I/O device to the memory device is the shortest
11 distance among distances between the plurality of I/O devices to
12 the plurality of memory devices;

13 a distance between the I/O device to the processor is the shortest distance
14 among distances between the plurality of I/O devices to the
15 plurality of processors;

16 a distance between the memory device to the processor is the shortest
17 distance among distances between the plurality of memory devices
18 to the plurality of processors.

1 23. (New) A system comprising:
2 a plurality of nodes having resources;
3 an operating system running on a processor in a node of the plurality of nodes;
4 firmware embodying relative distances between the plurality of nodes;
5 wherein, upon power-up, the operating system uses the relative distances between
6 the plurality of nodes in the firmware to allocate resources to be used by a
7 program.

1 24. (New) The system of claim 23 further comprising an interconnect fabric connecting
2 the plurality of nodes; the interconnect fabric includes node-controller chips and
3 cross-bar chips wherein
4 a node-controller chip connects at least one I/O controller, one memory
5 controller, a plurality of processors and a plurality of crossbar
6 chips; and
7 a crossbar chip, on a first side, connects to at least a node controller chip,
8 and, on a second side, connects to at least either a crossbar chip or
9 another interconnect chip.

1 25. (New) The system of claim 23 wherein a node of the plurality of nodes includes a
2 node-controller chip connecting at least an I/O controller, a memory controller, a
3 processor, and another node.

- 1 26. (New) The system of claim 23 wherein a node of the plurality of nodes includes one
2 or a combination of one or more of an I/O controller connected to I/O devices, a
3 memory controller connected to memory arrays, and one or more processors.
- 1 27. (New) The system of claim 23 wherein a node of the plurality of nodes includes a bus
2 connecting an I/O controller connected to I/O devices, a memory controller
3 connected to memory arrays, a plurality of processors, and a bridge connecting to
4 another node of the plurality of nodes.
- 1 28. (New) The system of claim 23 wherein an I/O device is first allocated, then a memory
2 array is allocated; a distance between the memory array to the I/O device is the
3 shortest distance among a plurality of distances between a plurality of memory
4 arrays to the I/O device.
- 1 29. (New) The system of claim 28 wherein a processor is allocated; a distance between
2 the processor to the I/O device is the shortest distance among a plurality of
3 distances between a plurality of processors to the I/O device.
- 1 30. (New) The system of claim 28 wherein a processor is allocated; a distance between
2 the processor to the memory array is the shortest distance among a plurality of
3 distances between a plurality of processors to the memory array.
- 1 31. (New) The method of claim 1 wherein the first resource is an I/O device connected to
2 a storage device storing the program or storing data associated with the program.